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POPULATION AGING AND GOVERNMENT DEFICITS IN CANADA

by

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POPULATION AGING AND GOVERNMENT DEFICITS IN CANADA

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1. Introduction

The impacts of population growth and aging on government deficits remains largely an unresolved issue in the theoretical and empirical literature. The facts that population growth and aging affect government expenditures and, most likely, government revenues are beyond dispute; what remains at issue is the magnitude of these impacts and hence their net impact on government deficits.

This is an issue that is not limited to a national level of government. It is pertinent to all levels of government, although the relative impacts may differ at the different levels of government. Consequently, it can also have important implications for the interrelationships between governments within a nation. In a federal state, such as Canada, both the direction and the magnitude of intergovernmental fiscal transfers can be influenced by these demographic developments.

From an international perspective these impacts are likely to be larger in Canada than in any other country. Demographically the age distribution of the Canadian population is more skewed than any other industrialized Western economy. This reflects, in large part, the dramatic increases in fertility rates immediately following the second World War which resulted in what has been generally referred to as the baby-boom generation. In Canada this "generation" spans the 20 year age group with birthyears between 1946 and 1965. By 1986 these baby-boomers are, therefore, in their twenties and thirties comprising almost 9 million persons or 35 per cent of the Canadian population. The peak of this generation is currently at 25 years of age; thus, the baby-boom profile is noticeably skewed with 15 years preceding the peak and only five years following the peak. Only the United States and Australia have similar profiles in both magnitude and duration.

The aging of this massive baby-boom generation has noticeable economic and social consequences. In Canada they first impacted the school systems over the 1950s and especially the 1960s. Their influence was then felt in the growth of the Canadian labour force, especially over the 1970s. Impacts on housing, consumption, productivity, savings and numerous other important economic variables can be expected in the years ahead.

Probably the most commonly used indicator of population aging is, however, the proportion of the population which is aged. This is usually interpreted as those beyond the traditional working years, which in Canada is usually taken as 65 years and over.

* The views expressed herein are those of the author and should not be attributed to the Institute or the Review.

This group has been increasing. By 1986 it totalled over 2.7 million persons representing nearly 10.7 per cent of the population, up from 2.0 million persons or 8.7 per cent of the population a decade earlier. Statistics Canada (1985) projections over the next decade indicate that this group will expand further to almost 3.6 million persons or 12.9 per cent of the population, and that this trend will continue into the next century.

Increasingly in modern Western economies, the responsibility for the aged is being transferred from a family or private responsibility to a social responsibility. This has considerable implications for governments and for government deficits, as recent debates on pensions and health care have aptly demonstrated. The linkages between population aging and government deficits, particularly in the Canadian context, is thus well substantiated and has many interesting dimensions. Moreover, it is likely to be of increasing relevance in the years ahead.

It is not the purpose of this paper to explore each of these dimensions individually. Rather, comprehensive frameworks within which to interpret these individual findings are outlined. These permit the incorporation and interpretation of past history, and an examination of likely future developments. The next section reviews the traditional demographic approach to these issues which focusses on the concept of a dependency ratio. It is argued that this is often interpreted as a measure of the economic burden on society and hence is a proxy for the ratio of expenditures to revenues and thus deficits. This is expanded in Section 3 to explicitly incorporate government and government expenditures. Suggestions for further refinements incorporating labour market activity measures are also outlined. Section 4 is devoted to a more careful examination of government revenues where, it is argued, the least is known about the impacts of population aging. The subsequent section reviews relevant existing literature on intergovernmental fiscal transfers, while Section 6 briefly examines the alternative approach of simulation models, including macroeconometric models. The paper finishes with a brief concluding section summarizing the main findings.

2. Dependency Ratios

Traditionally, demographers have approached the interrelationship between populations and the attendant economic implications for societies using the concept of dependency ratios. In this approach a population is divided into economically active and economically inactive groups. The most convenient indicator for such divisions has been age, with a population usually being divided into three groups:the economically inactive young, the economically active middle ages, and the economically inactive elderly. Under this approach, the young and the elderly then become "dependent" on the remainder of the society for their "support" or economic well-being.

In agrarian and less developed populations such economic transfers were generally undertaken in the context of the family unit, which developed complicated social structures to support these transfers. The elderly, for example, were not only being "rewarded" for services past rendered but also played an important role in the education and upbringing of the young. As societies became more developed and economic specialization spread, it no longer became possible for a family unit to provide for all or

even most of its needs. Trade with other units developed, first within the village, then between villages and regions, and finally between different societies. With trade extending beyond the family unit, the traditional ways of enforcing the transfers over a lifetime began to be eroded. It was within this context that a need for "government" arose. Government not only provided the laws regulating such transfers (e.g. no child labour), but also provided the means by which they could be executed (improved roads, communications systems, etc.).

More recently in modern societies, the very notion of the family unit has come under challenge. In this environment the need for governments to ensure the economic well-being of the economically inactive members of a society has taken on new dimensions. Since the young and the elderly are the groups least able to provide for themselves economically, modern society has turned to government programs, such as education, pensions and health care, to provide these groups with some of their basic economic needs. These programs are largely financed by taxes on the output and incomes produced by the economically active population. *In this sense*, the young and elderly are "dependent" on those of working age to provide these services and represent a "burden" on the society. Governments become the regulator and facilitator of such transfers. Under this simplistic view, if insufficient taxes are collected on the output and the incomes of the economically active population to support these programs, government deficits will arise, and vice versa for surpluses. (Discussion of the removal, maintenance or financial support of such deficits or surpluses is beyond the scope of this paper.)

To capture this complicated network of "obligations" and the associated economic implications for a society, demographers have focussed on dependency ratios. As suggested above, the most widely used measure divides a population (P) into three groups:

$$P = P1 + P2 + P3$$

where P1 = the number of pre-working age young persons,
P2 = the number of working age persons,
and P3 = the number of post-working age elderly persons.

A dependency ratio (DR) is then defined (Overbeek 1980, 140) as:

$$DR = \frac{P1 + P3}{P2} \qquad (1)$$

This is a ratio of the economically dependent population to the economically supporting population, and hence captures the pressures on the workers. In terms of government budgets, it is a proxy for the ratio of expenditures to revenues and hence a reflection of the pressure on deficits. It comprises two parts:

$$DR = \frac{P1}{P2} + \frac{P3}{P2} \qquad (2)$$

The former may be referred to as the youth dependency ratio and the latter as the elderly dependency ratio.* Note that these, in turn, can be conveniently expressed in terms of the shares (S) of each group in the total population:**

$$DR = \frac{P1/P}{P2/P} + \frac{P3/P}{P2/P} = \frac{S1}{S2} + \frac{S3}{S2} \qquad (3)$$

Under these definitions a decreasing DR indicates a reduced economic burden on society, while an increasing DR has the opposite implication.

In the Canadian context the three groups can be conveniently identified using labour force definitions. Those under age 15 years do not appear in the labour force and those over age 65 years are eligible for pension benefits. These two ages can, therefore, be used to conveniently divide the population into the three groups.

Taking a 200 year perspective, which includes past history (1851-1981) and likely future demographic developments (1981-2051), Foot (1982a, 127) demonstrates that the trend in the youth dependency ratio is downward while the trend in the elderly dependency ratio is upward. It is worth noting that, in this context, the impact of the baby-boom generation on the youth trend appears as an aberration on an otherwise downward trend. These trends are symptomatic of a generally aging population, which indicates that population aging is not a new phenomenon in Canada. The two trends do, however, have conflicting impacts on the dependency ratio – the declining youth ratio decreases DR while the rising elderly ratio increases DR.

What has been the net effect of these long-run trends? Foot (1982a, 130) shows that historically the declining youth ratio has generally more than offset the rising elderly ratio and hence the trend in DR has been downward. However, the emergence of the baby-boom generation noticeably increased the DR over the late 1940s and 1950s. These results suggest that, historically, population aging alone in Canada has tended to reduce the economic "burden" on the society. The increasing share of the elderly in the population has, in general, been more than offset by the decreasing share of the young in the population. The most noticeable time when this was *not* the case was associated with the emergence of the baby-boom generation.

By 1986 using Statistics Canada (1985) data the DR (3) is:

$$DR = \frac{0.2125}{0.6810} + \frac{0.1065}{0.6810} = \frac{0.3190}{0.6810} = 0.4685$$

down from 0.4753 in 1981. This implies that there are currently over two (2.134) persons of working age for every person of nonworking age in the Canadian population. This is an historically high figure.

* Appropriately defined, this is often referred to as the pension ratio.

** Another way of writing (1) is DR = (1-S2)/S2 ; that is, there is an inverse relationship between DR and S2.

Moreover, this situation is unlikely to change over the next 20 years. After a slight increase in DR in 1991 (to 0.4829) associated with the baby-boom echo effect, the low DR continues into the next century as these children of the baby-boomers become of labour force age.* For example, by 2006 there are projected to be 2.17 persons of working age for every person of nonworking age in the Canadian population (Statistics Canada 1985).

These calculations suggest that, at least for the next 20 years, the demographic pressures on government deficits are likely to remain at the current historically low levels. The declining share of the young in the population continues to more than offset the rising share of the elderly, and the taxable base of the population remains swelled by the entry of the baby-boom generation into the Canadian labour force.

3. Modified Dependency Ratios

From an economics viewpoint, dependency ratio calculations of the type illustrated in the previous section have a number of limitations. For example they assume explicitly or implicitly:

- that the per capita expenditures on the young are the same as those on the elderly;
- that the entire working age population is gainfully employed;

and

- that flexible resource transfers can be made between the young and the elderly.

Adjustments to the calculations are necessary if any (or all) of these requirements are not satisfied. Some progress has been made in the literature on this topic but much still needs to be done. This section is devoted to a review of the status of these issues.

First, consider the implied requirement that the per person costs of supporting the young and the elderly are equivalent. This assumption can be illustrated by a simple example. Consider a population with 100 people, 20 of whom are young, 70 of whom are of working age and the remaining 10 of whom are elderly. The associated DR is 0.4286 (=30/70). Now let the population age in such a way that one young person becomes of working age and one working aged person becomes elderly. The associated DR remains unchanged, reflecting a decline in the youth ratio (from 0.2857 to 0.2714) which is exactly offset by a rise in the elderly ratio (from 0.1428 to 0.1571).**

Interpretation of this mathematical result in economic terms, however, implicitly assumes that there are no significant differences in the per capita costs of the two dependent groups. This would appear to be an invalid assumption, *especially* with respect to government programs. There appears to be no relevant evidence in the literature with regard to the average per capita expenditures by different groups in society. In particular, although it is clear that the expenditures on the young will be on quite

* If fertility rates continue to decline this trend is intensifed.
** Note, therefore, that the DR is not necessarily an indicator of population aging.

different commodities than those on the elderly, there is no assessment of the per person difference. This is not surprising since these involve expenditures in both the private and public sectors. In modern societies, with the gradual demise of the family unit, there appears to have been a gradual transfer of some of these expenditures from the private sector (that is, the family) to the public sector. Health care expenditures provide one notable example in Canada. Moreover, it seems likely that the elderly have experienced this trend much more than the young. In general, the young are still cared for within a family unit whereas, increasingly, this is not the case for the elderly. This means that from the *public* sector viewpoint there is unlikely to be an equal per capita cost of supporting the young and the elderly. In particular, government has found relatively increasing pressure for support programs for the elderly.

In reviewing the empirical evidence, Clark, Kreps and Spengler (1978, 922) noted that in the U.S. "a broad measure of public support costs reveals that government expenditures are three times as great for older dependents as for youths". For Canada, Foot (1982a, 135), using data compiled by the federal Treasury Board Secretariat (1977), noted that a figure closer to two-and-a-half would appear to be more appropriate. But whatever the exact figure, it certainly appears that in terms of government programs it is significantly more expensive to support an elderly person than a young person.

Under these conditions DR would not be a good indicator of the burden on the government sector resulting from population aging. A rising elderly ratio even if exactly offset by a declining youth ratio, would result in an *increase* in government spending, and hence deficits. Thus, in an aging population it is likely that these differential per capita support costs will be reflected in increased government spending and deficits.

In an attempt to investigate this issue, Foot (1982a, 140-1) constructed an expenditure dependency ratio using alternative differential weights. The calculations indicated that a minimum was reached in 1982 for Canada after which the increasing share of the elderly in the Canadian population would place increased burdens on governments. Thus population aging would have much more immediate effects on these modified dependency ratio measures than is indicated by the traditional dependency ratio approach (see Section 2). Foot (1982a, 143) concluded "policy makers in Canada can enjoy a hiatus of no more than five years (depending on the province) in the early 1980s before the demographic pressures of population aging can be expected to place upward pressure on public expenditures". This hiatus is now over and these calculations suggest that, in the future, government deficits can be expected to increase as a result of population aging.

Subsequently, Foot (1982b) extended these calculations to account for the fact that not all recipients of government support programs are in the young or elderly age groups. For example, many welfare and unemployment insurance recipients are of working age. In fact, the data compiled by the Treasury Board Secretariat show that the average per capita cost of all age-specific government programs in Canada (in $1976) amounted to:

- $1,889 for the young (0 to 14 years)
- $1,118 for the working age (15 to 64 years)

– $4,745 for the elderly (65 years and over).*

However, incorporation of such data into the calculations also implies that the entire working age population is not gainfully employed.

This raises the second limitation of traditional dependency ratios. While all persons of working age are potential labour force entrants, not all choose to enter the labour force. In Canada currently, approximately two out of every three potential labour force participants actually enter the labour force.** But even then there is no guarantee that they will be gainfully employed. An unemployment rate around 10 per cent implies that one in 10 of the labour force entrants will not be a worker. Moreover, while all of the young dependents are excluded from the labour force, the same is not true of the elderly dependents where approximately 8 per cent enter the labour market. These considerations suggest the need for labour force participation rates (PR) and unemployment rates (UR) in dependency ratio calculations.

Foot (1982b) outlines the steps necessary to incorporate these features and derives a modified dependency ratio (MDR) of the form:

$$MDR = \frac{\Sigma Wi\,[Ni\text{-}\,(1\text{-}URi)\,(PRi)\,(Pi)]}{k\Sigma\,(1\text{-}URi)\,(PRi)\,(Pi)} \qquad i=1,3 \qquad (4)$$

where PR1 = 0 (the young do not work) and k is an arbitrary normalization factor.*** From this formula it is clear that increasing labour force participation rates place downward pressures on MDR as the "burdens" are shared over a greater proportion of the population, but increasing unemployment rates place upward pressures on MDR as the unemployed leave the ranks of the workers and join the ranks of the "dependents". Foot finds that over the 1970s the effects of the former outweighed the effects of the latter, thus reinforcing the underlying demographic trends of reducing the dependency pressures on Canadian society. Further increases in participation rates and reductions in unemployment rates in the years ahead would provide complementary reductions in dependency pressures. In fact, Foot (1982b, 27) shows that, over the next decade or two, even relatively modest changes could more than offset the underlying negative effects of population aging on government deficits.

In all of these results there still remains the implicit assumption that the necessary resource transfers can be made within the dependent population by government; that is, in an aging society it is possible to gradually transfer the real expenditure savings on programs directed to the young (such as education) to those directed to the elderly (such as old age security). To many this is an heroic assumption, as it is well known that client groups do not forego their benefits without a fight. Three observations are, perhaps, pertinent in this regard. First, the transfers do not have to be made abruptly, but can be

* Note that 4745/1889 = 2.51 which is where the previously noted figure comes from.

** Actually it is closer to three out of four for those aged 15 to 64 years.

*** Foot (1982b) presents the results in index form with 1981 = 1.0.

effected gradually, perhaps over a decade or two. Second, in times of inflation they can even be effected by allocating nominal increases in program expenditures which are less than inflation (just ask the universities!).

The third observation is somewhat more complicated. It may well be that the necessary resource transfers, which are assumed proportional to population numbers, may not be as large as those indicated by these calculations. Some of the real savings on the young may be nonexistent due to diseconomies of scale as programs (such as education) are contracted, while some of the necessary expansion of resources to the elderly may be unnecessary due to economies of scale as programs (such as health care) are expanded. In essence this criticism of the dependency ratio calculations focuses on the constancy of the per capita costs in the calculations. Given appropriate empirical evidence, however, there is nothing in the framework which inherently imposes this limitation. Alternatively, within the framework it would be possible to estimate when and by how much the relative costs would have to change to maintain an unchanging dependency ratio.

Finally, it is worth returning to the observation that dependency ratios, however modified, are often interpreted as simple proxy measures for the ratio of expenditures to revenues. A rising dependency ratio based on public expenditure data, therefore, implies a bigger government deficit (or smaller surplus), and vice versa. As such, however, they embody a simplistic assumption regarding taxation revenues and this is explored in the following section.

4. Government Revenues

Dependency ratio calculations of the type reported in the previous two sections, when interpreted in economic burden terms, involve a simplistic notion about the collection of revenues. They assume a taxation structure which is proportional to the numbers (or share) of workers in the population. Such a proportional head tax went out of favour as a taxation base in the Middle Ages! A less rigorous interpretation might argue that income and output is determined by the number of workers (presumably via a production function), and that the myriad of taxes collected in a modern society which includes both progressive and regressive elements can be best approximated by a proportional taxation structure.

This interpretation overlooks the complexity of the taxation structure in modern societies. In particular, it ignores the existing progressivity of the income tax which is deliberately designed to avoid proportional taxes. Recent protestations for the establishment of a proportional income tax structure, particularly in the U.S., have not yet been translated into action. It also ignores sales taxes (which generally are proportional to expenditures) and the myriad of other revenue sources of modern governments.

Of particular interest for this paper is whether or not government revenues can be expected to be influenced by population aging, rather than simply by population numbers. This issue appears to have been completely neglected in the literature – an omission

which could have important consequences for the assessment of population aging on government deficits. The brief arguments presented below are indicative of the types of issues which can be raised. Since no results exist in the literature, any conclusions must be treated as speculative.

First, consider the income tax structure. In Canada this is designed to be progressive, with increasing marginal tax rates at higher (real) income levels. The human capital literature is replete with both theoretical and empirical observations on the high correlation between age and income. Age is often interpreted as a proxy for labour market experience, but it is also used to measure other personal attributes, such as maturity, stability, etc. Under these conditions, an aging population will likely generate output and income increases which are more than proportional to the number of workers.* Given a progressive income tax structure, revenues from this source will increase even more than proportionately with the number of workers. Moreover, with the baby-boom generation only having recently entered the labour force in Canada, this large group in the labour force has almost its entire working career ahead of it. This suggests that if the current labour force peak is around age 25 and *if* real income peaks at, say, age 50**, then nonproportional real taxation revenue increases from this source can be expected to be experienced in Canada for the next 25 years. If this is the case, dependency ratio calculations implicitly have too small a denominator and hence conclusions drawn from them regarding the possible pressures on government deficits are overstated.

Second, consider sales taxes. These are expenditure taxes and generally are proportional to the value of expenditures (e.g. 7 per cent in Ontario). A number of necessities are exempt from the tax (books, rent), while luxury items are often subject to higher rates (restaurant meals) or surtaxes (air conditioning in autos). For the majority of the Canadian population, it is likely that aging gradually alters consumption patterns. Besides the more obvious changes from meat to chicken and pizza to salad consumption, there will be other, probably more significant changes in expenditure patterns. For example, when the baby-boom generation left home in the 1970s there was a dramatic increase in the proportion of income devoted to rent. Currently, this is apparently being translated to mortgage (and hence interest) payments. However, as both the permanent renters and the new home buyers age in the future it is likely to be used to purchase luxury-type items on which higher taxes may be collected. So, again population aging could lead to increased taxation revenues.

These two illustrative examples underscore the simplicity of the assumptions regarding government revenues in dependency ratio calculations and the dearth of information (either theoretical or empirical) in the literature. A more accurate assessment of the effects of population aging on government revenues and hence deficits in Canada and elsewhere requires this gap in knowledge to be carefully assessed.

* Providing, of course, the law of diminishing returns does not offset these developments.

** Foot and Trefler (1983) estimate that real *family* income peaks at age 44 in Canada.

5. Intergovernmental Transfers

With these caveats in mind, Foot (1984) explored the effects of population aging on intergovernmental transfers in the Canadian federation. In this context the expenditures of one level of government become the revenues of another level of government and hence not all government revenues are ignored in these calculations.

Because of the constitutionally influenced allocation of expenditure responsibilities, past demographic pressures experienced primarily in education and health programs, initiated significant fiscal transfers between levels of government in Canada. Under these conditions it was widely acknowledged that a fiscal imbalance existed, with the sub-national levels of government having greater responsibilities for the provision of services required by the young generation. By the early 1980s, two reports (by a Parliamentary Task Force and the Economic Council of Canada) concluded that there was no evidence that a structural fiscal imbalance existed. Foot (1984) interpreted these findings as evidence of a long-run trend gradually moving towards fiscal imbalance in the future as the federal government struggles with the responsibilities associated with an aging population.

In disaggregating government expenditures by level of government Foot (1984) reported that the relative per capita costs of providing government services to the young and elderly in Canada differed markedly between the three levels of government. Whereas for all levels of government combined it cost 2.5 times as much to maintain an elderly person on public programs as a young person, the comparable figures were 0.4 for municipal governments, 1.1 for provincial governments and a massive 8.4 for the federal government. Foot concludes that "under these conditions it would appear that the federal government experiences the expenditure pains of population aging while municipal governments reap the expenditure gains!"(p. 410) and speculates that "these calculations might be interpreted to indicate greater pressure for fiscal centralization in Canadian government" (p. 412). Another possible, and perhaps more likely, outcome might be the reassignment of expenditure responsibilities between levels of government. Nonetheless the basic point remains that population aging can be expected to have considerable implications for fiscal federalism in Canada in the years ahead.

6. Simulation Models

The use of dependency ratios is by no means the only way to approach the impacts of population growth and aging on government deficits. It has advantages in simplicity and has considerable flexibility, but it cannot substitute for detailed analyses of particular sectors (such as education, housing, pensions and health care). Since the focus of this paper has been on a comprehensive approach to the topic, such analyses are not reviewed here. However, approaches which attempt to incorporate these results into a comprehensive framework are relevant in this context.

Denton and Spencer (1975, Ch.8) present one of the first such attempts in examining the effects of population change and the overall government budget using an economic-demographic simulation model calibrated on Canadian data. They consider

three expenditure categories; education and health care which are directly sensitive to the age distribution of the population, and general expenditures which is related to past levels of total output or income generated by the economy. Taxes are presumed to adjust to meet these expenditure demands. Deficits are, therefore, nonexistent. These simulations were considered "experimental", but they provided a foundation for subsequent work.

In a more recent paper Denton and Spencer (1984) deal with 149 different components of government expenditure*, and separate federal from provincial plus local expenditures. Results for 14 broad functional groups are presented. Once again taxes are not explicitly considered in their model. They find that real government expenditures of all kinds increase by less than the increases in population size and in real GNP, at least until the year 2020. Based on these results they conclude that "the increase in aggregate [government] expenditure that will be needed to maintain government services at their recent levels in the face of population change over the next several decades will be quite manageable" (p. 13). This conclusion is certainly consistent with the dependency ratio calculations noted above. They also note that population change will have a much greater impact on transfer payments (such as social security) than on expenditures on goods and services, and that demographic effects will be overshadowed by other effects in the determination of overall government budgets. In addition, they note that the provincial-local sector will be subject to somewhat smaller overall cost increases as a result of demographic change, a finding consistent with that of Section 5 above.

The impacts of population growth and aging on government deficits can also be simulated within the context of macroeconometric models, such as the CANDIDE Model. Most macroeconometric models include relatively little age detail and generally only include it in their labour force sectors. (See Foot (1980) for further details.) The larger the model the more disaggregated it is likely to be, and hence the more opportunity for the inclusion of demographic disaggregation. Once again, however, it is rare for this to be reflected in government expenditures let alone revenues. As with the Denton-Spencer simulation model, recent versions of the CANDIDE Model have sensitized relevant transfer payments, such as social security and health and education expenditures, to demographic detail using econometric equations. The results for government deficits, which are contained in the model, then incorporate these effects, together with the myriad of other (usually more important) macroeconomic effects (interest rates, real GNP growth, etc.).

In summary, it would appear that these alternative modelling approaches have, to date, provided little advancement on the more simple dependency ratio calculations. The conclusions of both approaches are very similar, and the insights provided by the increased complexity of the simulation models are of limited value. Moreover, no solution to the omission of the effects of population aging on government revenues is provided in these models.

* That is, 73 functional categories for expenditures on goods and services and for transfers to persons, and three aggregate expenditures: transfers to business, transfers to non-residents and other expenditures.

7. Conclusions

The existing literature on the effects of population growth and aging on government deficits in the Canadian context is substantial and varied, and generally consistent in its findings. It indicates that, as a result of the recent entry of the baby-boom generation into the working age population, the historically low burdens on government deficits from a demographic perspective can be expected to be continued into the next century. Moreover, unlike the past, the burdens are likely to be greater on the federal level of government than on the sub-national levels. These conclusions remain applicable when the greater costs of supporting the elderly on government programs, and the changing nature of labour force behaviour are incorporated into the calculations.

Refinements of traditional dependency ratios or simulation models to encompass these effects have been shown to produce useful modifications to the results based on "pure" demographic considerations, but all approaches to date have either ignored the impacts of population aging on government revenues or have been based on simplistic (and probably unrealistic) assumptions in this regard. More research would seem to be especially necessary in this area.

Finally, it is now well established that population aging is an inalienable characteristic of Canada's demographic future. To ignore its impacts on government deficits (not to mention numerous other economic and social variables) is to ignore a fundamental determinant of one of the key indicators in modern Canadian society both from an economic and a political viewpoint.

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